



# The Ramakrishna Mission PV Project — a Cooperation between India and the United States

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# Background

- Cooperative program established in 1993 by the Minister of the Indian Ministry of Non-Conventional Energy Sources (MNES) and the Secretary of the U.S. Department of Energy (USDOE)
- Three projects were identified, 50-50 cost shared, \$1.5M from each country; budget reductions necessitated reducing to one project, \$250K for each country
- Selected sustainable rural economic development initiative with Ramakrishna Mission in West Bengal, India as the nongovernment organization (NGO)
- Public solicitation resulted in selection of Applied Power Corporation, Lacey, WA for the systems integration and Remote Power International, Ft. Collins, CO for the training

# Objectives

- Establish the economic viability of PV in the Sundarbans region of West Bengal
- Have the project self-sustaining with minimal subsidies to the beneficiaries
- Establish the infrastructure for financing, training, installation and maintenance with the NGO taking the lead
- Work with the NGO to expand utilization of PV in the region
- Perform a before and after social, economic, and environmental impact study with the Tata Energy Research Institute (TERI)

# Project Responsibilities

- The United States furnishes:
  - PV modules, charge controllers
  - Water pump
  - Training
- India furnishes:
  - Batteries, compact fluorescent lamps, fixtures
  - Mounting structures, wiring , all balance-of-systems components
  - Solar lanterns
  - Custom duties
- The Ramakrishna Mission furnishes:
  - Personnel for installation and maintenance
  - Revenue collection from systems beneficiaries

## Project Responsibilities (cont'd)

- The West Bengal Renewable Energy Development Agency furnishes:
  - Technical backup to the project
  - PV powered vaccine refrigerator
- Exide Industries Ltd. (under contract to MNES) furnishes:
  - Equipment delivery from customs and to sites
  - Assistance in installation

# Project Financing

- Beneficiaries of the PV systems are asked invest their own money according to their ability to pay
- Typical domestic home lighting systems in India cost approximately Rs. 14,000 ( 1\$  $\approx$  Rs. 35 ); Rs. 6,000 is available as a government subsidy
- The amount to be borne by the user, Rs. 8,000, requires a down payment of Rs. 3,500 at the time of installation with Rs. 4,500 treated as a low interest loan repaid in monthly installments of Rs. 40 over ten years, realizing Rs. 4,800 (Rs. 4,500 against the loan, Rs. 300 as interest)
- In addition Rs. 20 per month will be charged as a maintenance fund for which beneficiaries receive free service at their doorsteps
- Any surplus will go into a revolving credit fund to purchase additional systems

# Applications to be Fielded

Village Name	Domestic	Street Lights	Battery Charger	Water Pump	Vaccine Refrigerator
Gosaba	Training Center-10 with 1, 50-W PV panel, 70A-hr bat.,plus 5 at battery charger	3 with 11-watt CFL's, 100 A-hr battery	1-for 10, 100 A-hr batteries, 4 kW PV 20 solar lanterns	1 Grundfos , SP5A-7, 800 W. PV	
Katakhali	100 homes Youth club-2				
Pakhirala	Weaving center-8, 11-W CFL's	3 with 11-watt CFL's			
Satyanaryanpur	Health Clinic 8-11W CFL's		1 (same as Gosaba)		1(furnished by WBREDA)
Kumirmari	100 homes				
Satjelia	100 homes				
Various Jetties		9			

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